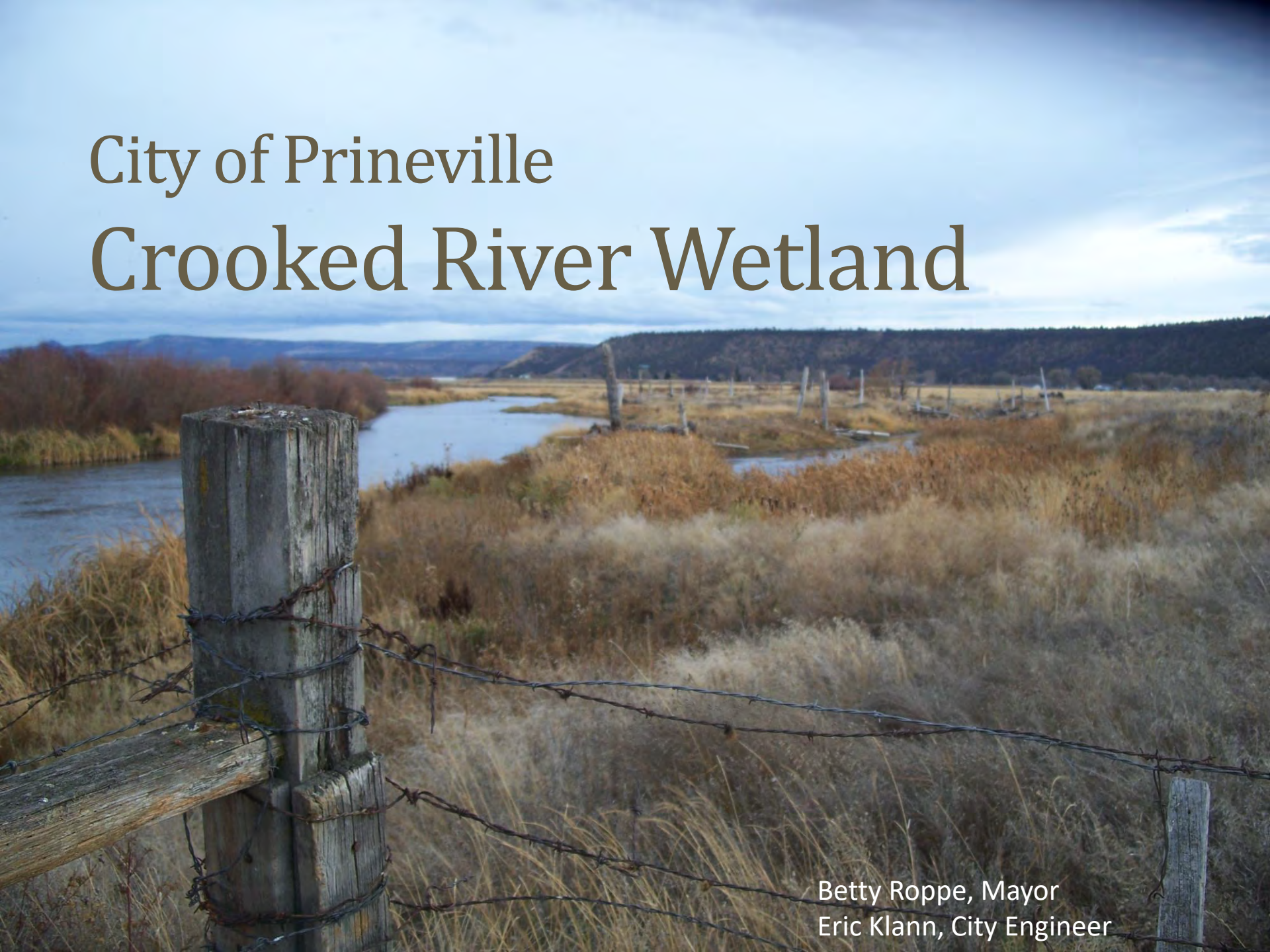


# City of Prineville
# Crooked River Wetland

Betty Roppe, Mayor
Eric Klann, City Engineer

# CROOKED RIVER WETLAND

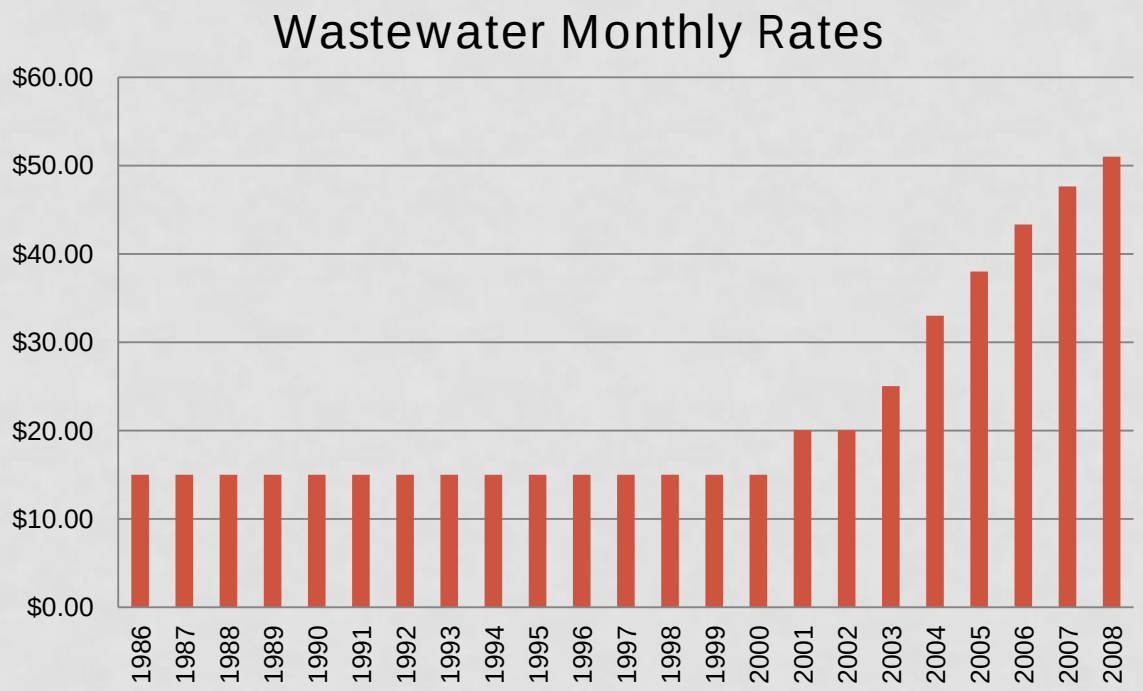
# CROOKED RIVER WETLAND

# CROOKED RIVER WETLAND

- Historic treatment lagoons and effluent disposal…
  - Approximately 560 acres of treatment lagoons, storage and pasture land.
  - Capable of treating 1.67 million gallons of influent per day.
  - Citizens did not have access to lagoons and pasture land.

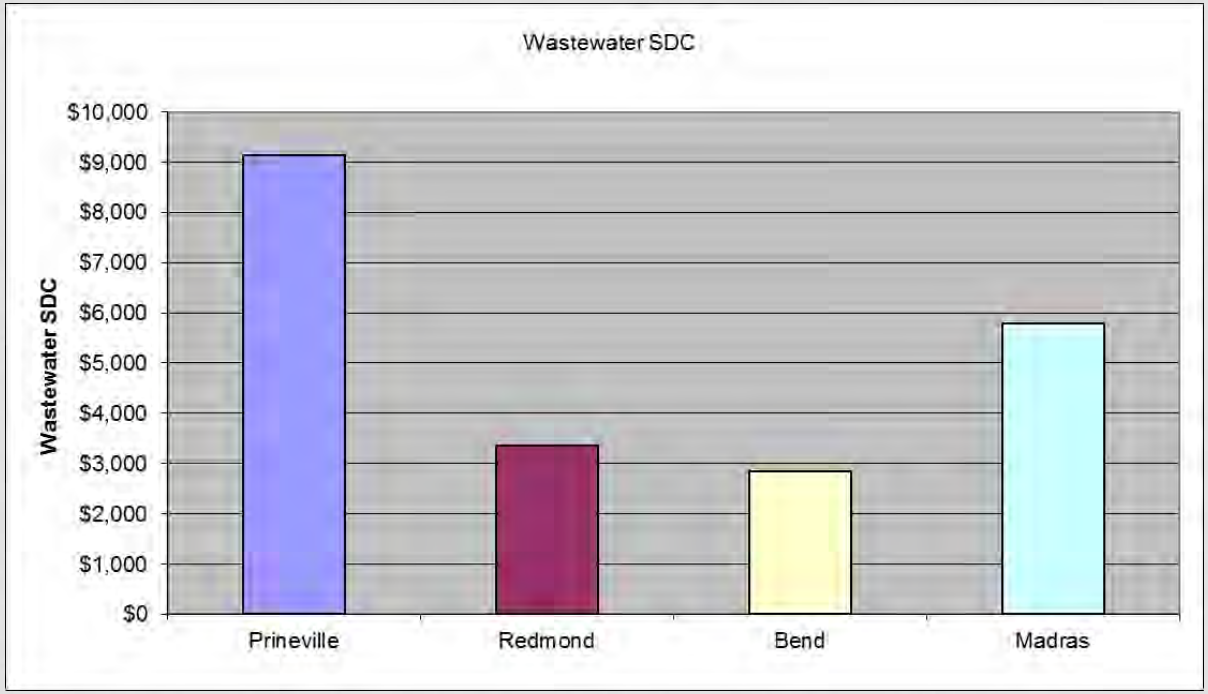
# CROOKED RIVER WETLAND

- 2002-04 Plant Expansion:
  - $14,000,000 All debt, no grants
  - Rate increases of…
    - 2001 = 25%
    - 2002 = 0%
    - 2003 = 20%
    - 2004 = 24%
    - 2005 = 13%
    - 2006 = 12%
    - 2007 = 9%
    - 2008 = 6.6%



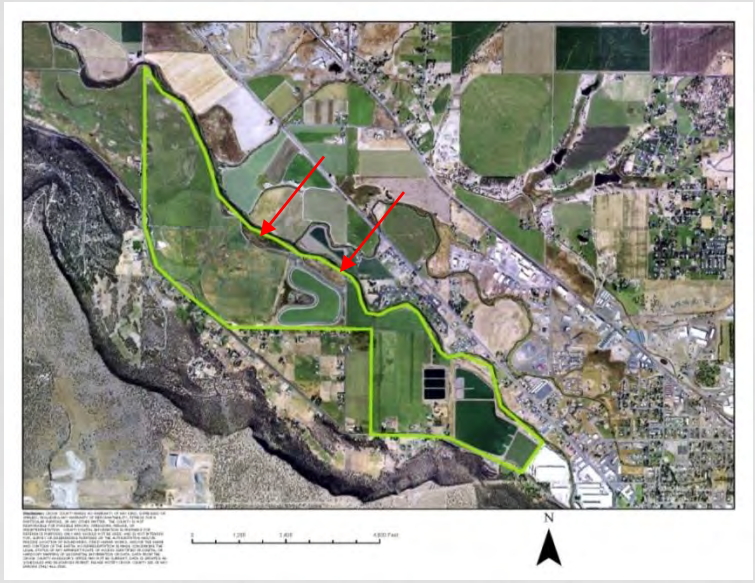
# CROOKED RIVER WETLAND

- 2005 Facility Plan
  - Mechanical Treatment
  - Est Cost $62,000,000
  - Wastewater SDC increased to $9,147
  - Decision was made based upon ease of permitting…



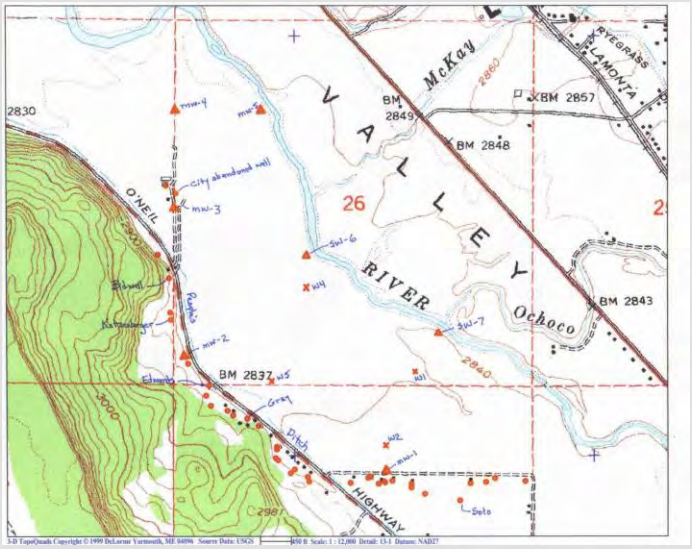
# CROOKED RIVER WETLAND UPDATE

- Previous Wetland Projects
  - ODOT wetland mitigation project (fall 2008)
    - 10 acres in size
  - Crooked River Watershed Council wetland project (fall 2009)
    - Approximately 3 acres in size.



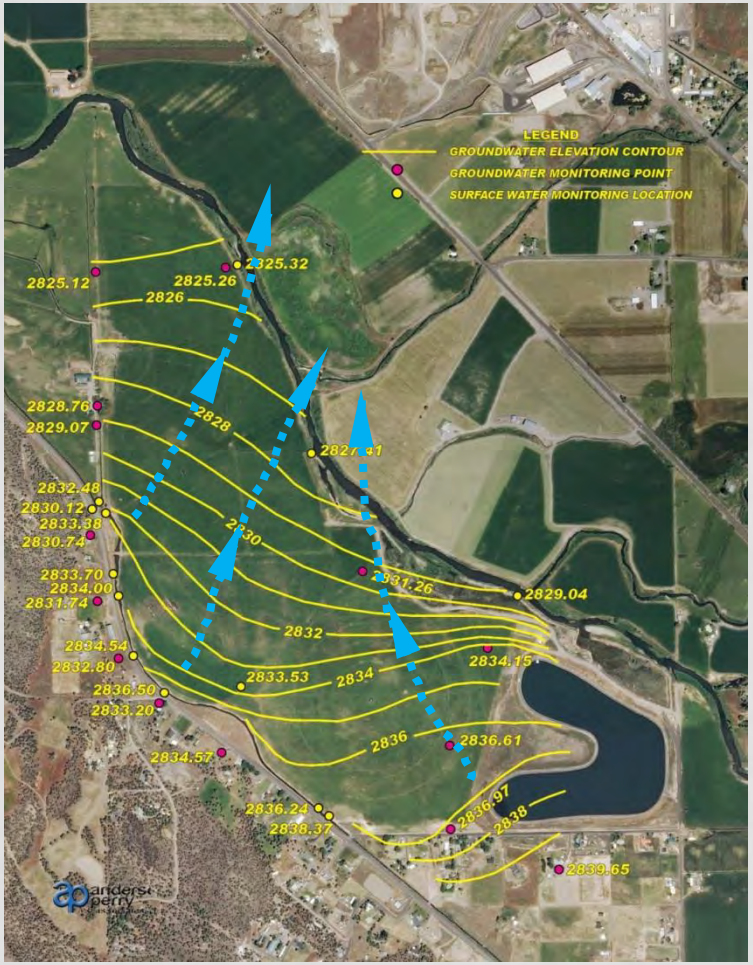

# CROOKED RIVER WETLAND UPDATE

- Preliminary Groundwater Assessment
  - The City installed 12 groundwater monitoring wells.
  - Groundwater surface elevations were gathered to determine groundwater contours.
  - Water quality information will be used as a "baseline".




# CROOKED RIVER WETLAND UPDATE

- Research has allowed for the creation of a groundwater model.
  - 12 test wells with multiple pump tests.
  - Groundwater model use to predict the results of "groundwater mounding"
  - Proposed groundwater flows will continue to the Crooked River.

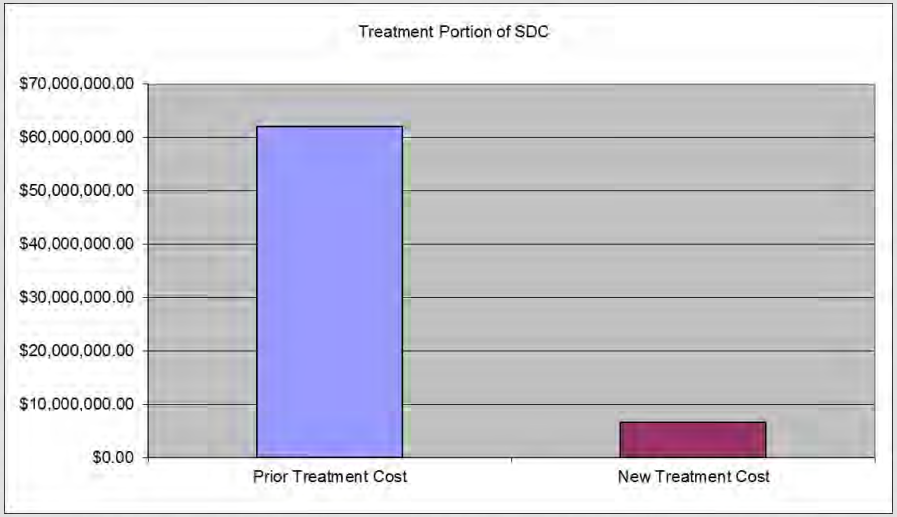


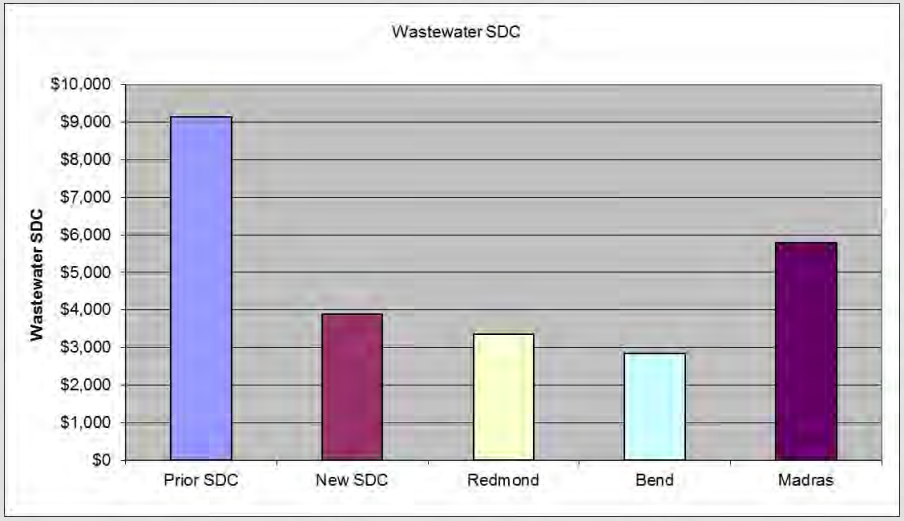
# CROOKED RIVER WETLAND

- Benefits of "wetland" type treatment
  - Substantially less initial and O&M costs
  - Less land required for disposal
  - Wetlands offer additional treatment.
  - Special interest groups may partner to develop wildlife habitat.

# CROOKED RIVER WETLAND

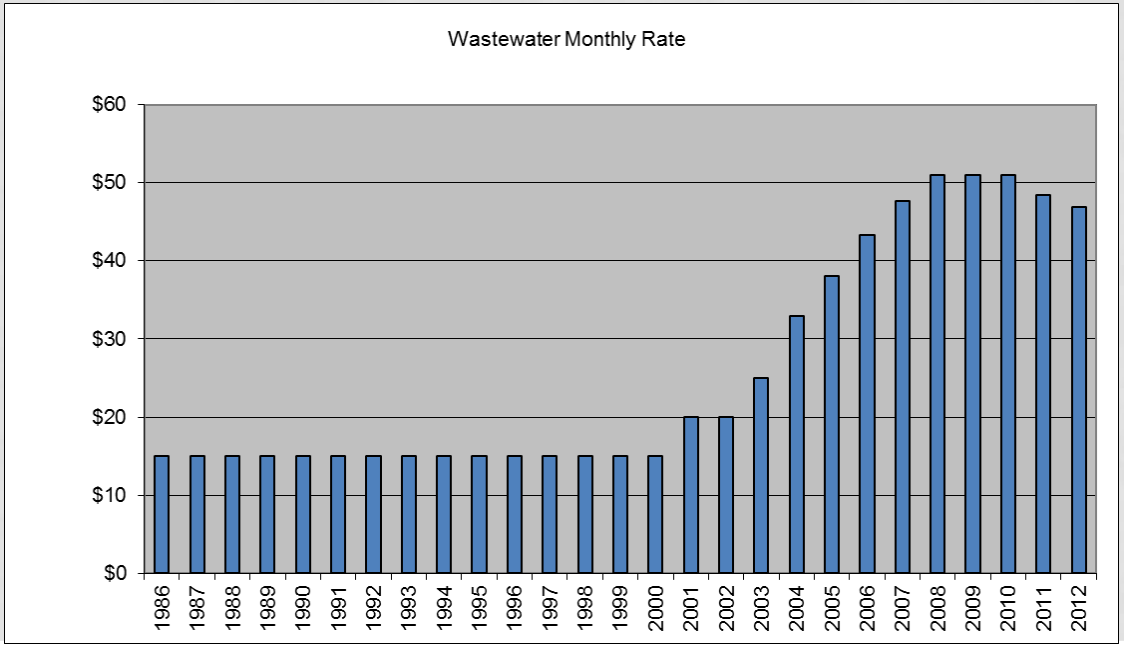
- Wetland Disposal
  - Treatment Cost reduced from $62,000,000 to $6,600,000.
  - SDC reduced from $9,147 to $3,875



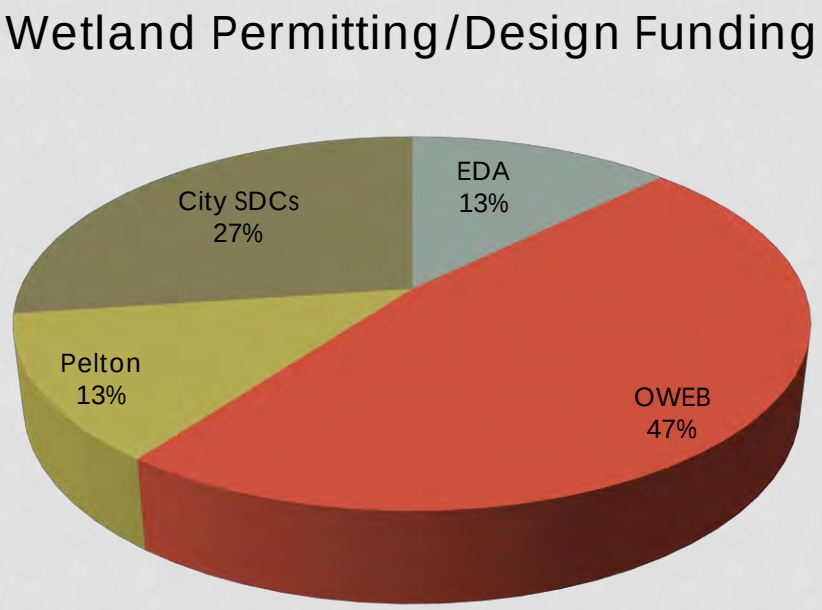
# CROOKED RIVER WETLAND

- Reimbursement!
  - $14,000,000 (2005 expansion debt)
  - $2,258,984 (interest accrued thru 2010)
  - $16,258,984 debt 2010
  - 27.5% of all wastewater SDCs are reimbursement!
  - This allowed for the stabilization and reduction in rates!



# CROOKED RIVER WETLAND UPDATE

- Permitting and Design Process
  - Permitting/Design Total Cost ($590,000)
  - EDA $75,000
  - OWEB $280,000
  - Pelton $75,000
  - City SDCs $160,000



# CROOKED RIVER WETLAND

- Design commenced with a kickoff meeting and the creation of four interest groups:
  - Wetland Habitat
  - Riparian Improvements
  - Education/Recreation
  - Vector Control

# CROOKED RIVER WETLAND

- Wetland Habitat
  - Different habitat for different species…
  - Specific needs throughout the year…
  - Public/Wildlife interaction…

# CROOKED RIVER WETLAND

- Riparian Improvements
  - Riparian Improvement have garnered great interest.
  - Steelhead/Salmonid habitat is greatly needed in the middle Crooked.
    - Confluence of Ochoco and McKay Creeks…

# The Crooked River at Prineville 1869 -2011

anderson perry & associates, inc.

anderson perry & associates, inc.

# CROOKED RIVER WETLAND

- Education/Recreation
  - How can we turn all of this into a learning opportunity?
  - Plan for easy field trips in the future…

# CROOKED RIVER WETLAND

- 13 Educational Kiosks
  - Local Schools research a topic and work with a graphic designer.
  - Informational packets will allow for easy field trips in the future.
  - Subjects range from the Crooked River Watershed to Macroinvertebrates.
  - Crooked River Elementary, Pollinators

# CROOKED RIVER WETLAND

## Native Pollinators: Bees and Butterflies

*Important workers for our environment*

*Life depends on little things we take for granted.* - Disneynature

Pollinators are animals that cause plants to make fruit or seeds. They do this by moving pollen from one part of the flower of a plant to another part, fertilizing the plant. Only fertilized plants can make fruit and/or seeds, and without them, plants cannot reproduce. The survival and protection of pollinators like butterflies and bees are critical to our way of life. In fact, more than 130 fruits and vegetables are cross-pollinated by honey bees and a third of our food as well as most flowers cannot exist without bees and pollinators.

Pollinators are suffering from the loss of wildflower habitat, rapidly spreading diseases and climate change. As a result, they are stressed out and more susceptible to pesticide poisoning. There are simple things everyone can do to help.

**Plant Milkweed in your yard.** It's the Monarch's sole food source as caterpillars. The caterpillar has a very recognizable yellow, white and red striping. As a butterfly, the monarch's wings feature an easily recognizable black, orange, and white pattern on its wings, with a wingspan of 3.5 – 4 inches.

**Know the difference between a honey bee and a wasp** — we need the honey bees! Honey bees are hairy, while wasps usually have smooth and shiny skin. Honey bees are oval shaped and golden brown or black with stripes. Wasps have narrow waists, four wings and may be brightly colored black and yellow. When in doubt, don't spray until you know for sure.

**Did you know?** A honey bee hive is filled with thousands of female worker bees, male drone bees, and ONE queen bee. There are many native pollinator foraging plants and trees as well as honey bee hives throughout the park.

**Be pollinator friendly — simple things you can do:**

- *Plant for the pollinators – use native plants. Contact your local extension office for more information.*
- *Support your local beekeepers. Purchase local honey, and ask for help if you need to move a swarm.*
- *Avoid using pesticides.*
- *Know the difference between a honey bee and a wasp.*
- *Encourage your local community to implement pollinator friendly practices.*

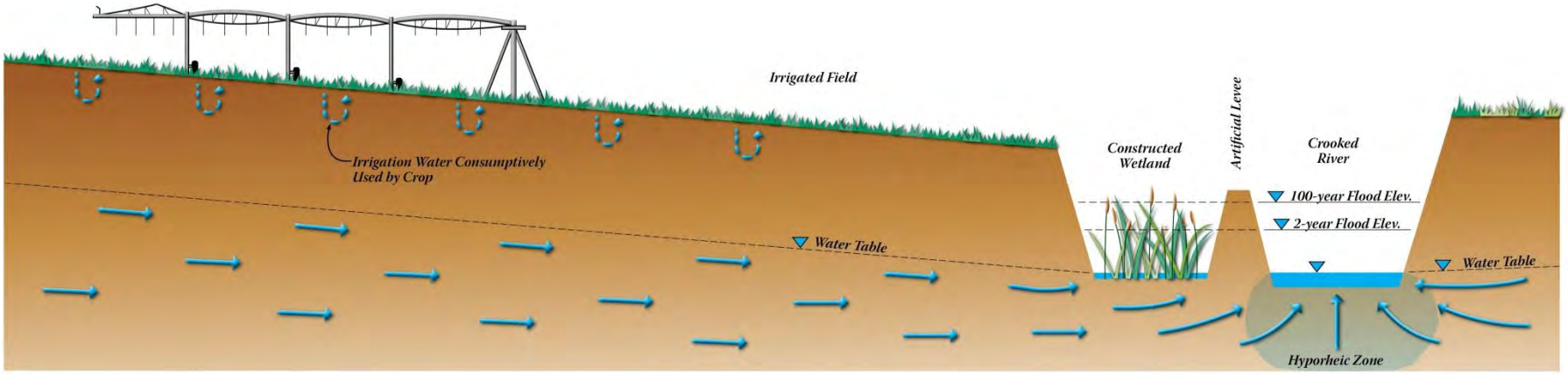
**Encourage pollinators to your yard** by planting clover and blue and purple flowers — since honey bees don't see red. Avoid using pesticides. If you must, please apply them in the evenings after foraging is done for the day and avoid windy days.

**Thanks to:**
*Jeri McCormack and Marissa Stafford's 3rd grade writing group from Crooked River Elementary 2015-2016.*

**Find out more:**
*Be a citizen scientist! You can help track Monarchs and milkweed by submitting your sightings to the online western monarch milkweed mapper at www.monarchmilkweedmapper.org*

# CROOKED RIVER WETLAND

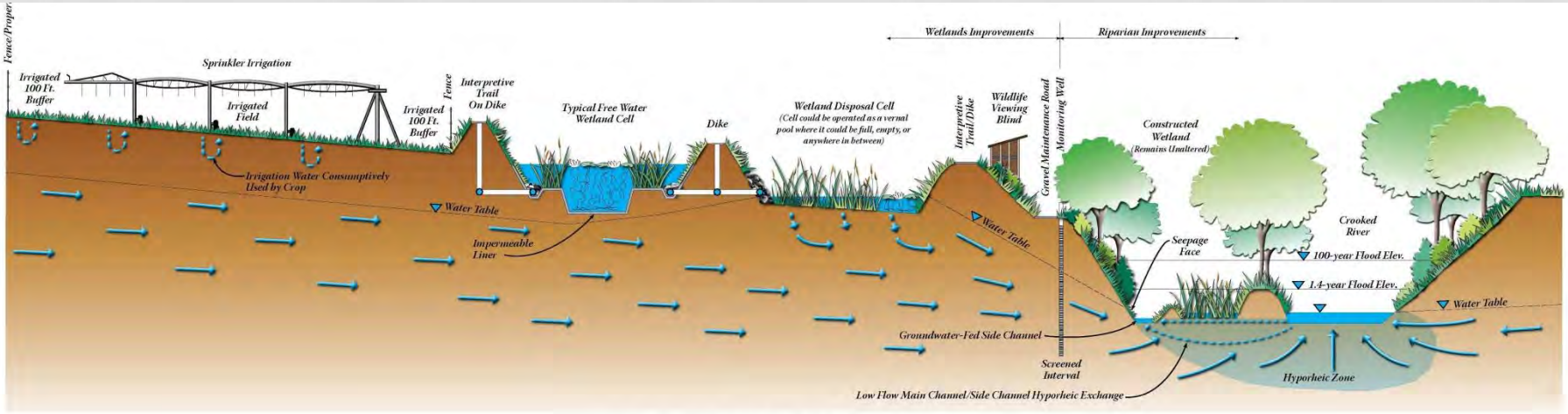
- Prior cross-section and groundwater flows…
  - All effluent consumptively used, no recharge.
  - Existing riparian habitat is very limited.




*Existing Site Profile*

# CROOKED RIVER WETLAND

- New groundwater flows…
  - Wetlands further polish the effluent.
  - Additional water recharges the hyporheic zone of the Crooked River.

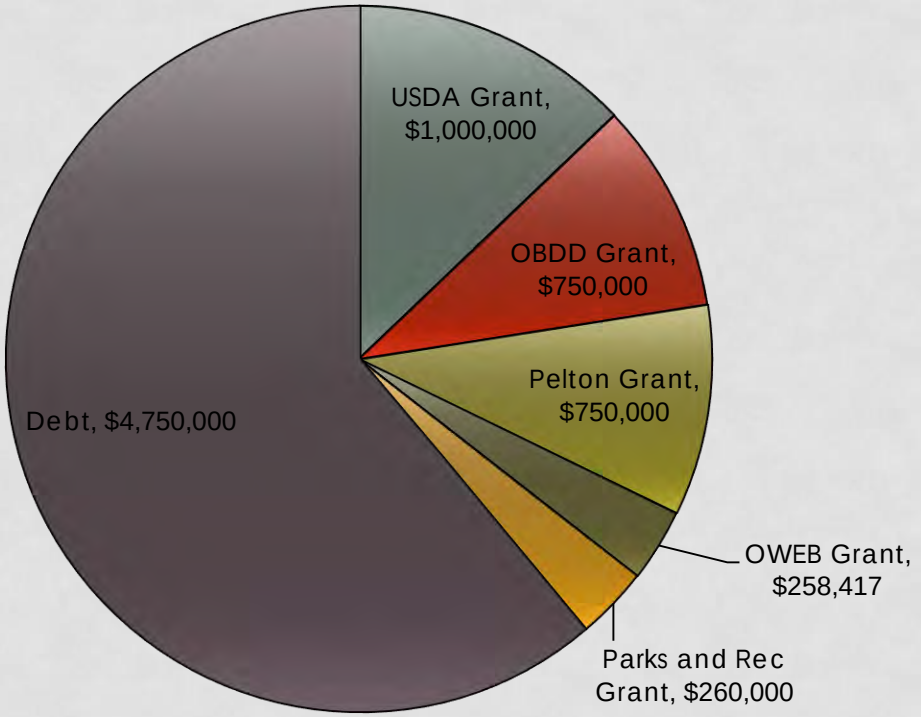



*Conceptual Wetlands Profile - Option 1*

CITY OF PRINEVILLE, OREGON
CROOKED RIVER WETLANDS PROJECT

# CROOKED RIVER WETLAND

- Wetland Construction Grants
  - Total cost $7,768,417
  - Rural Development Grant = $1,000,000
  - OBDD Grant = $750,000
  - Pelton Grant = $750,000
  - OWEB Grant = $258,417
  - Parks and Rec Grant= $260,000
  - City Debt = $4,750,000 (1% to 2.875%)



# CROOKED RIVER WETLAND

# Crooked River Wetlands Complex

*(Graphical Presentation)*

*Riparian Plantings, Habitat Structures, Bank Protection, Pools, and Side Channels, Typical Along Crooked River*

*Disposal Wetlands, Typical*

*5.4 Miles of Walking Paths*

*Parking*

*Pivot Irrigation, Typical*

*Covered Event Center and Restrooms*

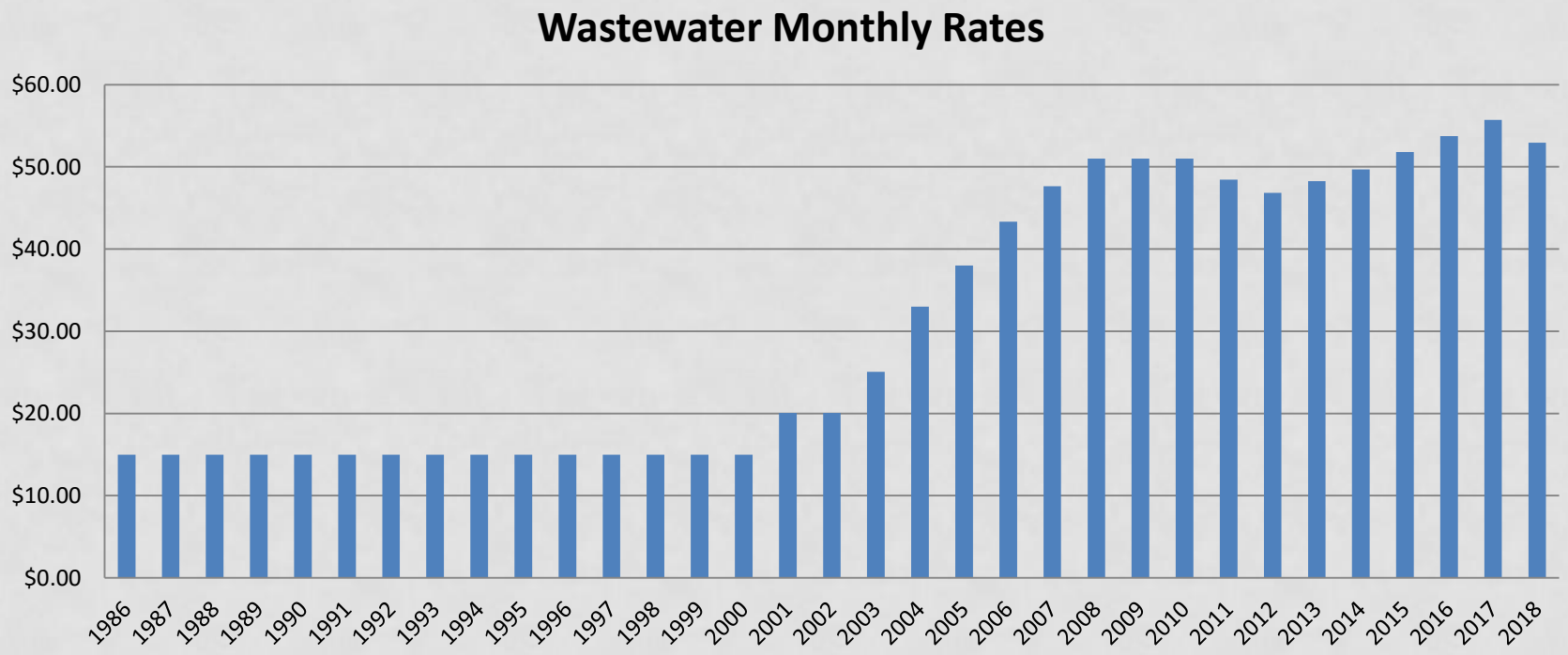
*Constructed Wetlands, Typical*

Crooked River

Oregon Highway 370

# CROOKED RIVER WETLAND

- Swr Costs
  - 3.7% increases through construction.
  - 0-1% increases thereafter!



# CROOKED RIVER WETLAND

- Groundbreaking Ceremony
  - April 22, 2016 (Earth Day)

# WHO NEEDS A SHOVEL?

# CONSTRUCTION!!!!

# CONSTRUCTION!!!!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# SUCCESS!

# AWARDS TO DATE

- Oregon American Water Works Project of the Year, 2016
- Oregon Association of Clean Water Agencies 2017 Outstanding Member Agency, on to Nationals!
- Oregon ACEC 2017 Project of the Year, on to Nationals!
- LOC 2017 Award for Excellence
- Oregon Audubon Society 2017 Conservationist of the Year.

# RIPARIAN IMPROVEMENTS - SUCCESS

# RIPARIAN

# RIPARIAN

# RIPARIAN

# RIPARIAN

# RIPARIAN

# RIPARIAN

# RIPARIAN

# RIPARIAN

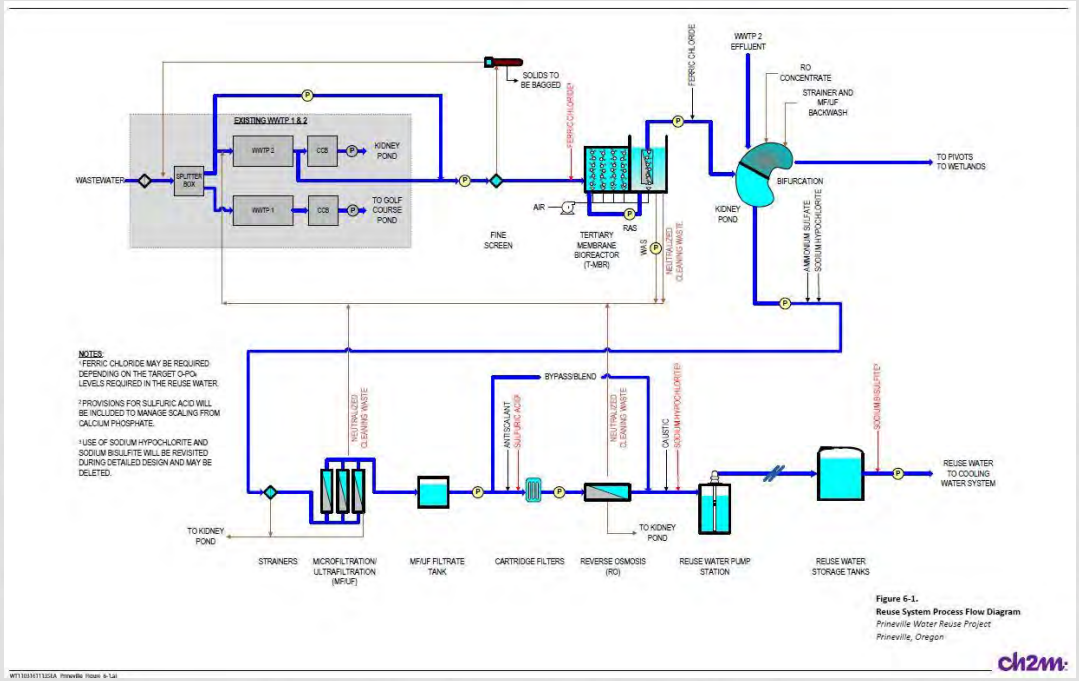
# EAGLE SCOUTS

# FUTURE PROJECTS

- Water Reuse
- Water Conservation
- Aquifer Storage and Recovery
- Hydroelectric

# FUTURE PROJECTS

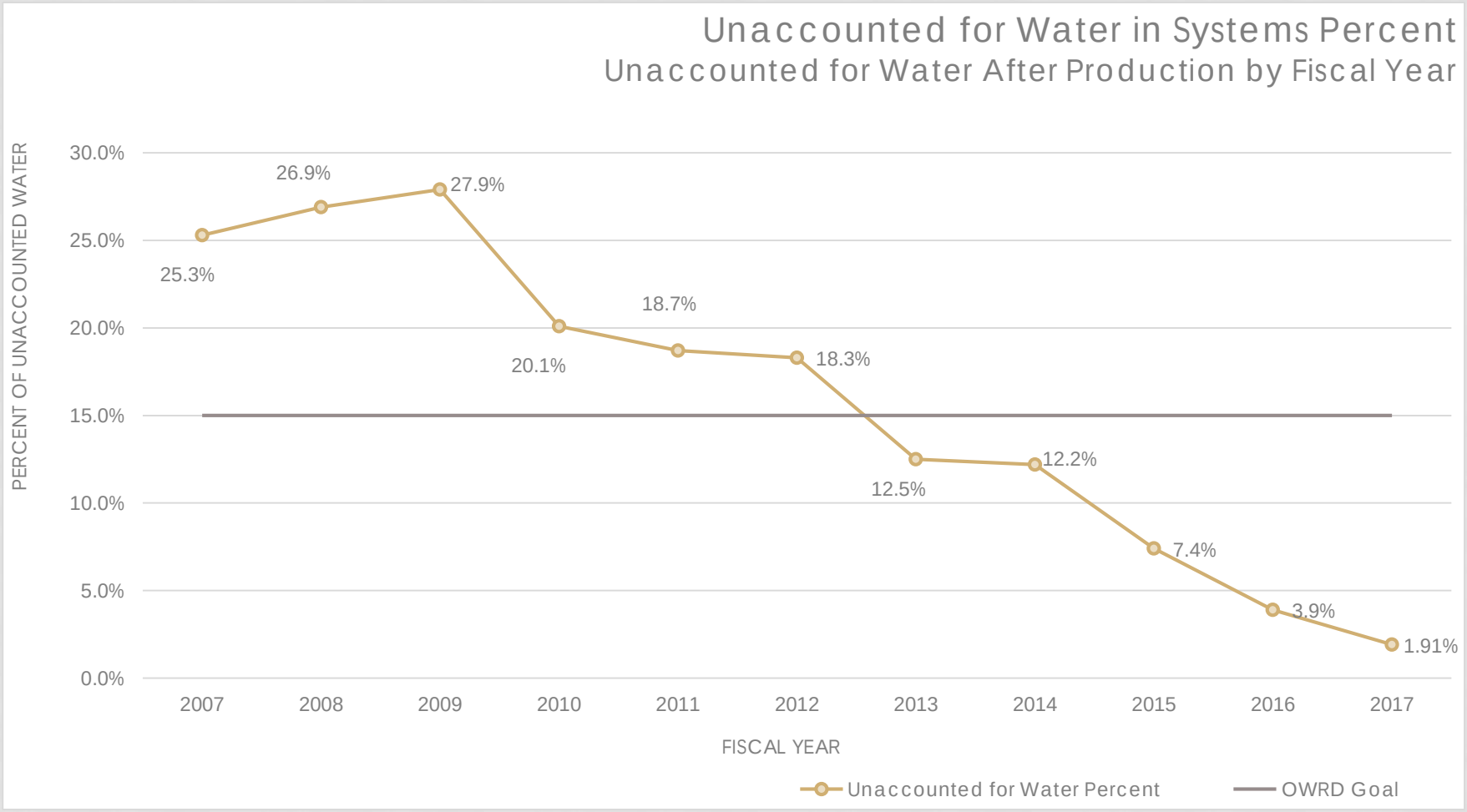
- Water Reuse
  - Polish wastewater beyond drinking water quality
    - Tertiary Membrane Bioreactor
    - Nano-filtration/RO



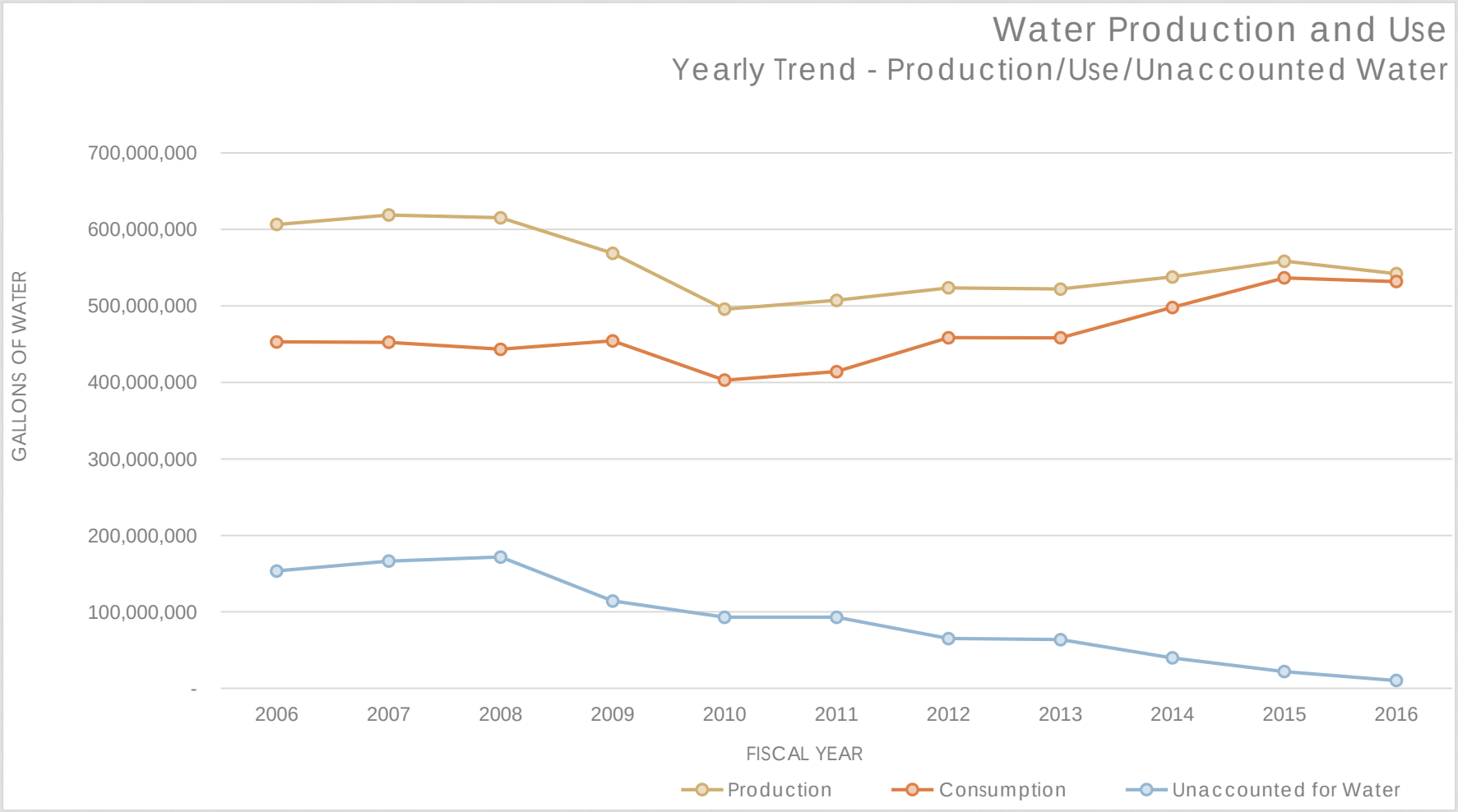
# FUTURE PROJECTS

- Water Conservation Projects
  - City provides about 600 million gallons of water per year to 3,600 connections.
  - OWRD would like our unaccounted water to be 10-15%
  - City Unaccounted water peaked at 28% in 2008 (lost 172 million gallons)
  - Water Conservation has become a top priority

# FUTURE PROJECTS



# FUTURE PROJECTS



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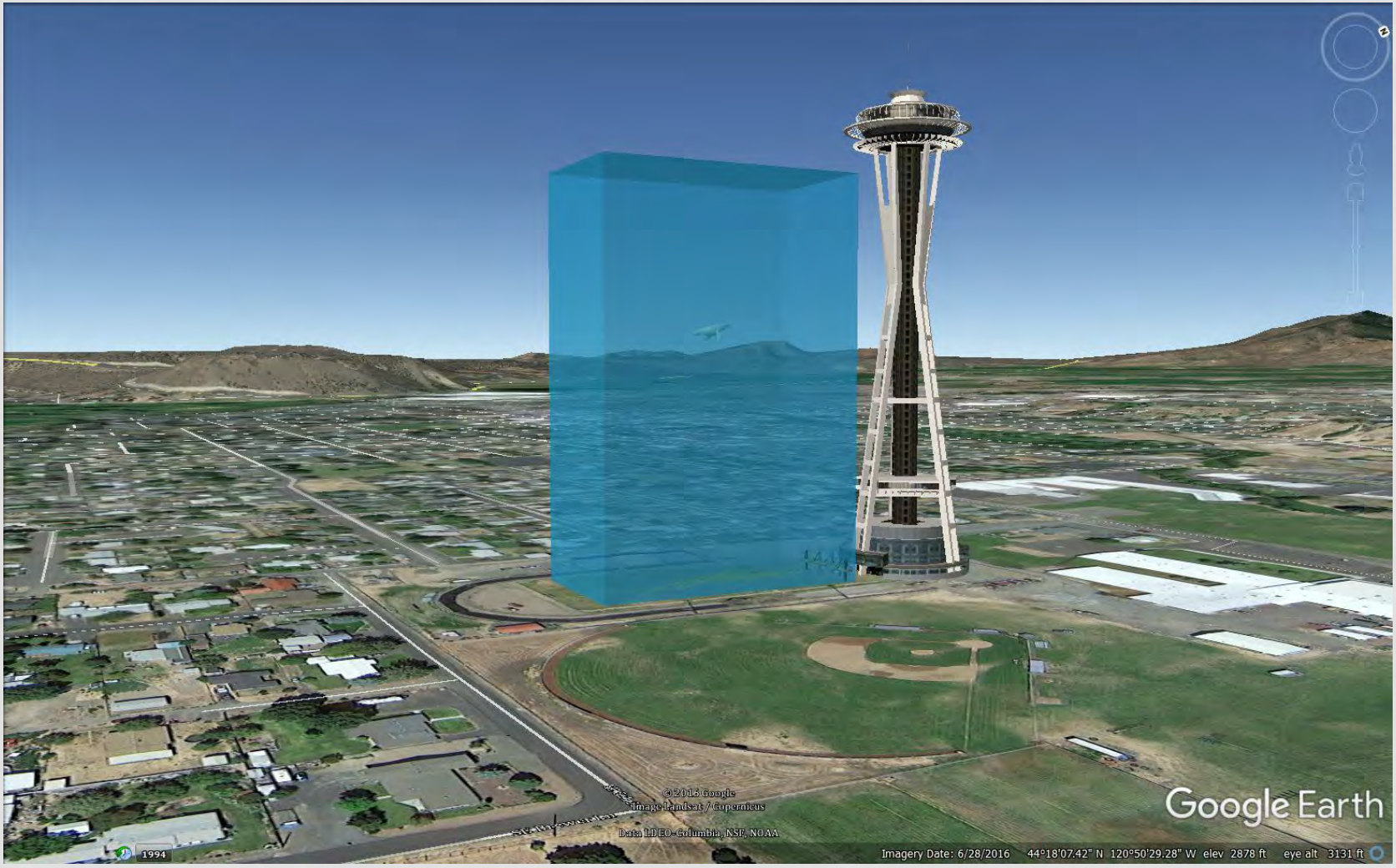
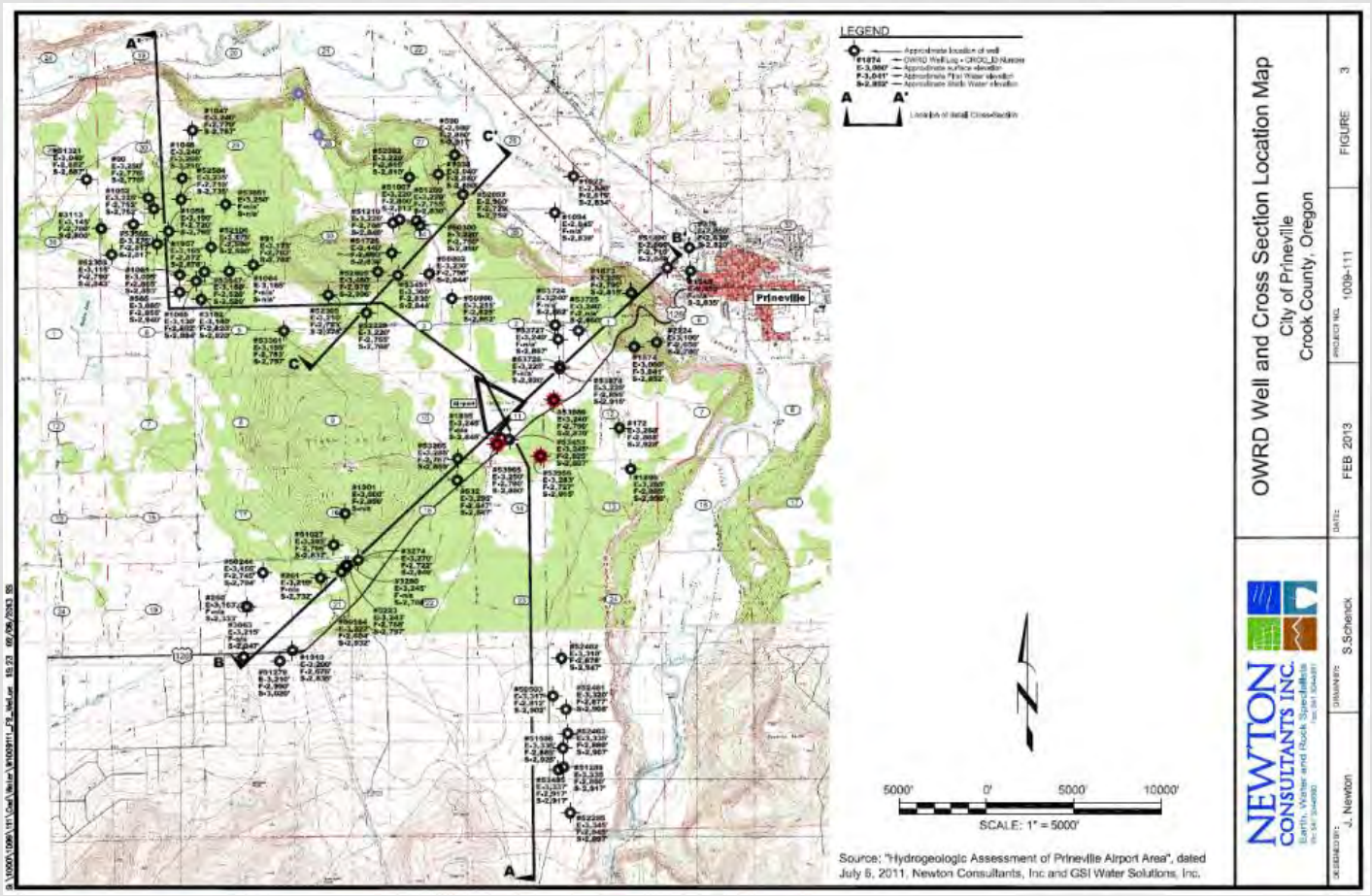


# FUTURE PROJECTS

- Aquifer Storage and Recovery



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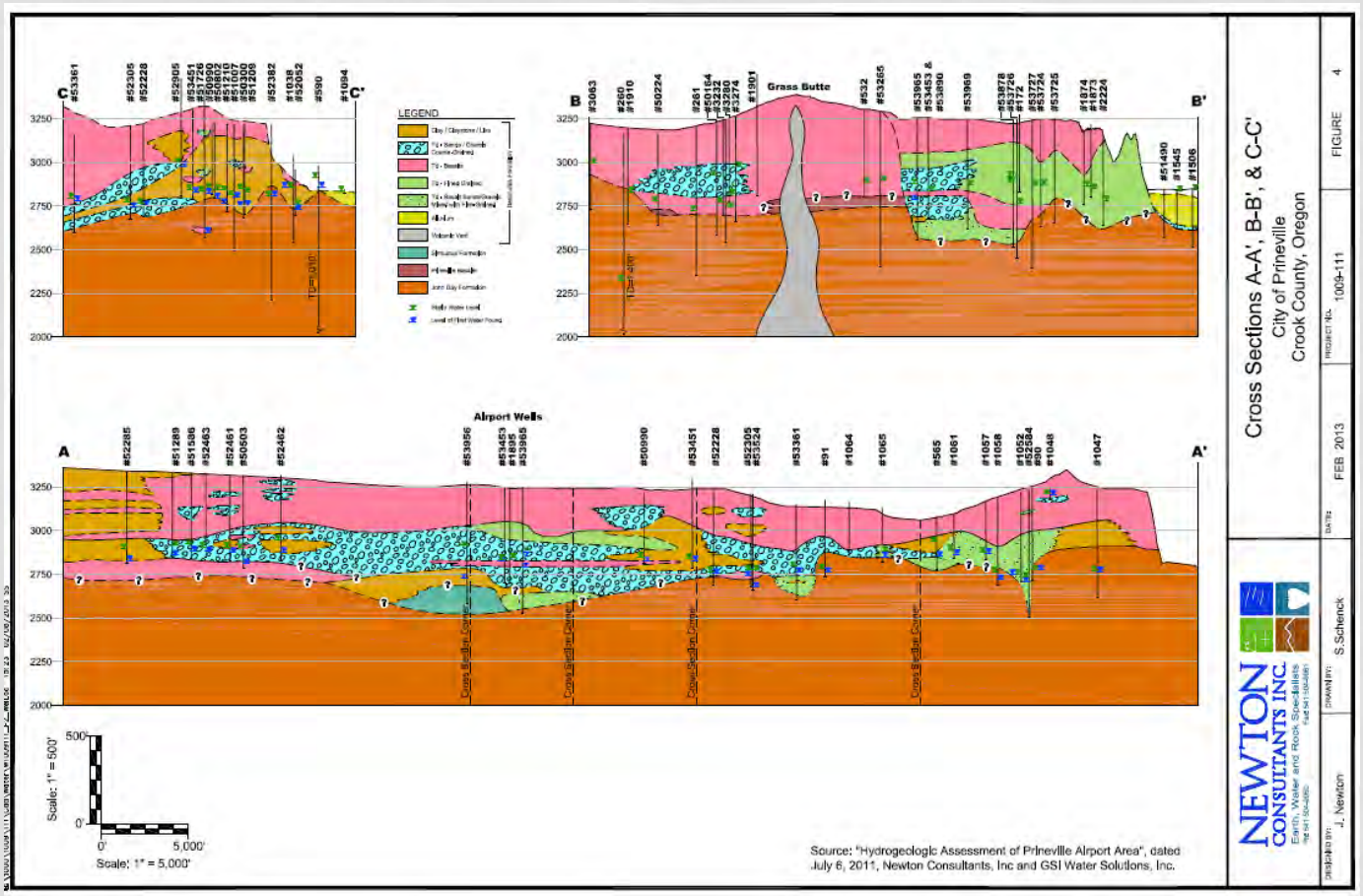

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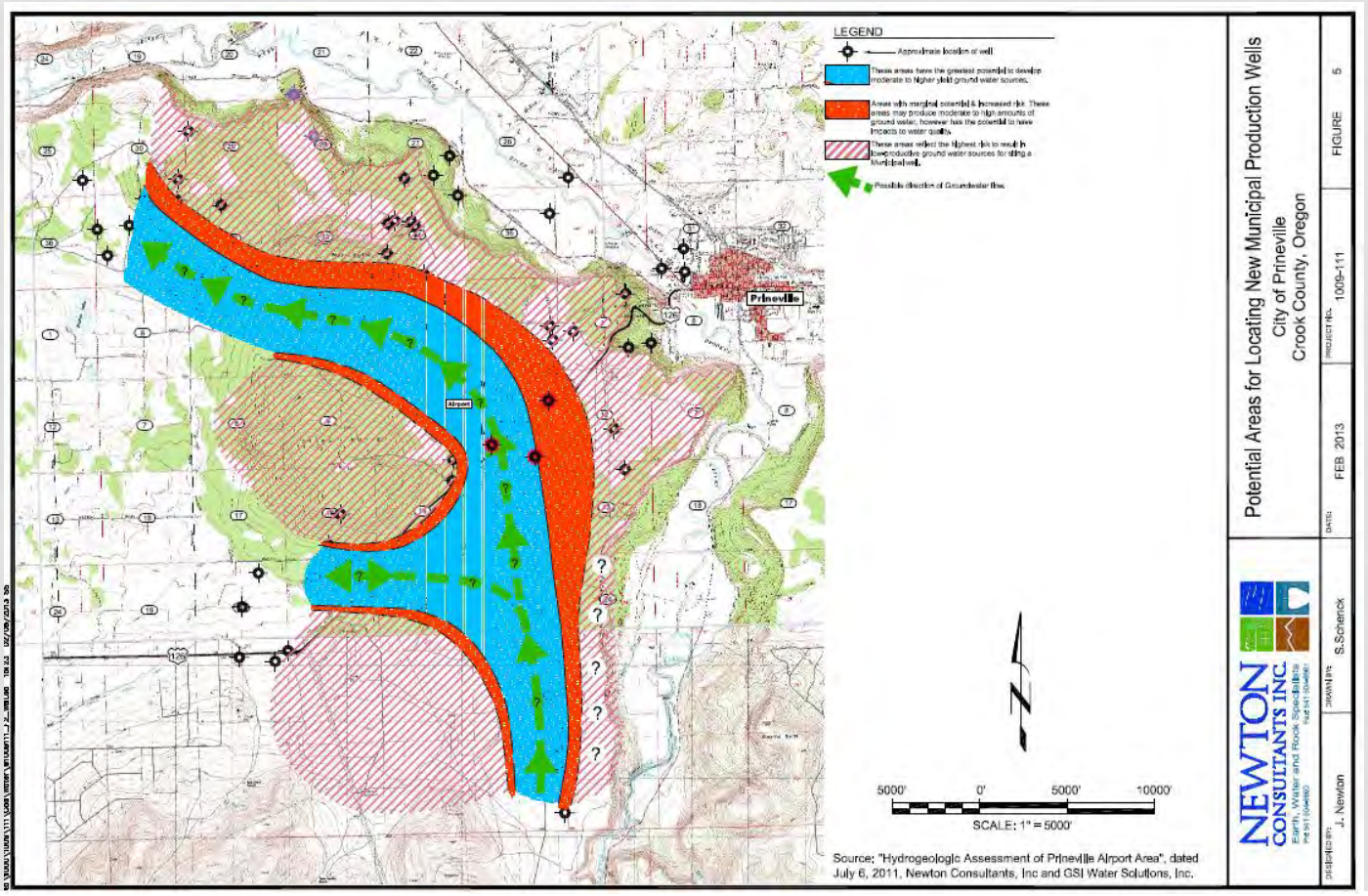
- Aquifer Storage and Recovery



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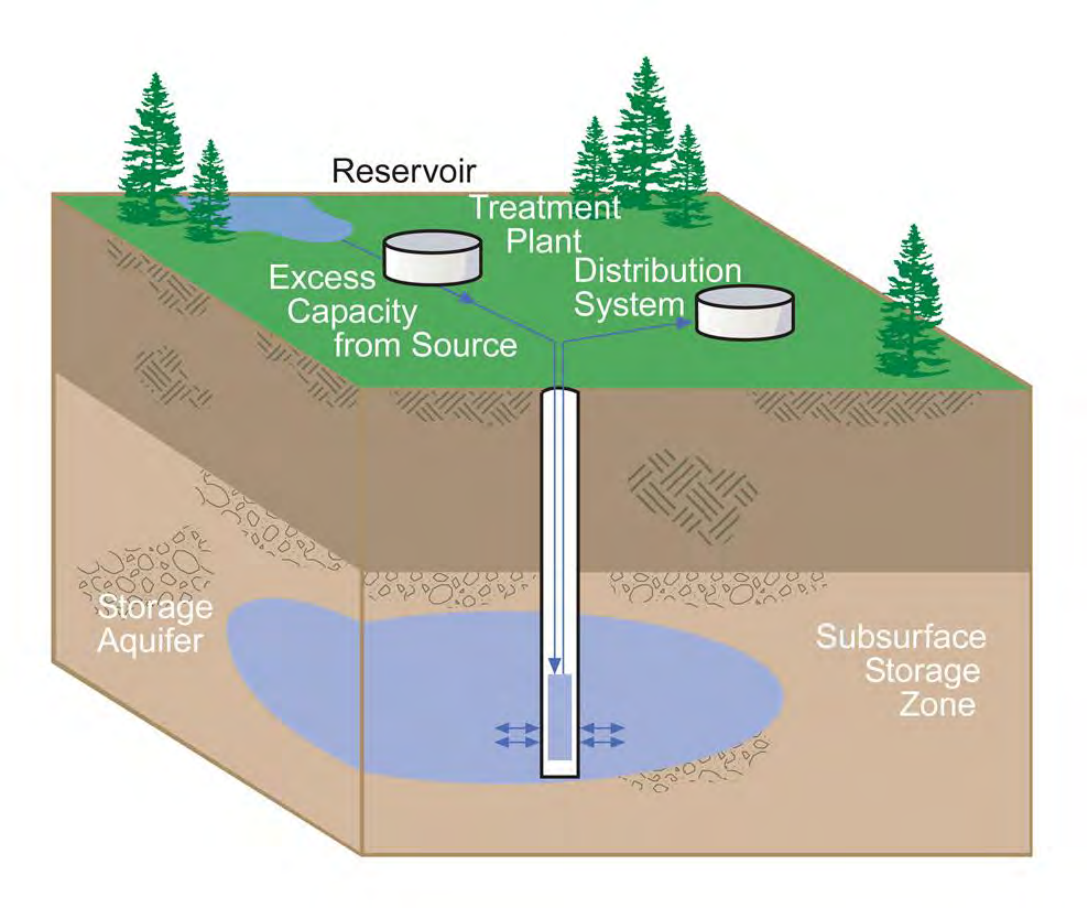
- Aquifer Storage and Recovery



# FUTURE PROJECTS

- Bowman Hydro

# PRINEVILLE RULES!!!

- Any Questions?